

REMARKS

The Examiner has objected to claim 30 as reciting the same limitations as claim 2.

Claim 30 has been cancelled. Accordingly, this objection is now moot.

Claims 1-5 and 30 stand rejected under 30 USC 102(b) as being anticipated by Patel.

Claims 6 and 7 stand rejected under 103 (a) as being unpatentable over Patel in view of Kitayama.

These rejections are respectfully traversed.

Claim 1 claims a liquid crystal device that includes a liquid crystal material that shows almost no spontaneous polarization which is perpendicular to the pair of substrates under the absence of an externally applied voltage. The "almost no spontaneous polarization" in the liquid crystal device is described in the specification and may be confirmed by a method of measuring the presence of spontaneous polarization perpendicular to the substrate, as described on page 23, line 22 to page 24, line 22.

The "almost no spontaneous polarization" means that the spontaneous polarization has no practical contribution to the electro-optic response of the device and is the reason why the device does not show a peak current at the electro-optic response. In addition, as described on page 25, lines 6-16, a liquid crystal material capable of showing a ferroelectric property may be used in the claimed device. However, as shown in Fig. 12, even when a liquid crystal material capable of showing a ferroelectric property is used, the device is constructed so that the liquid crystal material does not exhibit its ferroelectric property in the device.

The references cited by the Examiner fail to disclose or suggest a liquid crystal device that includes a liquid crystal material that shows almost no spontaneous polarization which is perpendicular to the pair of substrates under the absence of an externally applied voltage as claimed.

Patel discloses a twisted ferroelectric liquid-crystal optical modulator that includes a first assembly and a second assembly arranged a predetermined distance apart with a gap between the

two assemblies. Ferroelectric liquid crystal fills this gap. In Patel the ferroelectric property of the liquid crystals in Patel is fully exhibited.

Fig. 2 of this reference clearly shows that the ferroelectric liquid crystal molecules have a polarization vector P perpendicular to the alignment layer 18 (i.e., perpendicular to the substrate 10) under the absence of an external electric field E . Accordingly, Patel fails to disclose a liquid crystal device that includes a liquid crystal material that shows almost no spontaneous polarization which is perpendicular to the pair of substrates under the absence of an externally applied voltage as claimed.

In addition, since Patel's device fully exhibits the ferroelectric property of the liquid crystal material, Patel's device will show a single peak-shaped electric current due to the inversion of the direction of the ferroelectric liquid crystal molecules when subjected to the measurement as described in page 23, line 22 to page 24, line 22 of the application. This also demonstrates that Patel fails to disclose or suggest a liquid crystal material that shows almost no spontaneous polarization which is perpendicular to the pair of substrates under the absence of an externally applied voltage as claimed.

Kitayama discloses a liquid crystal device for gradational display that includes a pair of substrates each provided with an electrode and a chiral smectic liquid crystal (i.e. ferroelectric liquid crystal) disposed between the substrates. In Kitayama, it is clear that the ferroelectric property of the liquid crystal material is fully exhibited.

As with Patel, since the device in Kitayama fully exhibits the ferroelectric property of the liquid crystal material, Kitayama's device will show a peak-shaped electric current due to the inversion of the direction of the ferroelectric liquid crystal molecules when subjected to the measurement as described in page 23, line 22 to page 24, line 22 of the application. Further, since the respective regions of the ferroelectric liquid crystal molecules may have different inversion conditions, Kitayama's device may show a plurality of peak-shaped electric currents. As described

above, the presence of a peak current demonstrates that Kitayama fails to disclose a liquid crystal material that shows almost no spontaneous polarization which is perpendicular to the pair of substrates under the absence of an externally applied voltage as claimed.

For the foregoing reasons, the rejections of claims 1-6 should be withdrawn.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing Attorney Docket No. 350292001900.

Dated: February 21, 2006

Respectfully submitted,

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